2: Jochelson E-5 (1884-1902) 1933 Yakut

Verkhne Kolymsk through the upper course of the Indighirka River determined the greatest height to be 2362 meters,[1] while recently, another geologist, Sergei Obruchev, observed a maximum altitude of 3300 meters[2] in the upper course of the Indighirka River. His statements concerning the inhabitants of the region are not consistent with the actual facts. He believes the Yakut are Mongol and that the Tungus are the aborigines of the country. Actually the Yakut are Turkic. Both tribes are immigrants: the Yakut from the Baikal country and the Tungus from the Amur region, or perhaps from southeastern China.

Flora

Despite the vast extent of territory between the Kolyma and the Lena rivers and the Verkhoyansk Range and the Arctic Ocean, the flora is confined to few species. This may be explained by its geographical position and the severity of the climate. Wherever the growing period lasts only about three months the flora cannot be rich. Of trees there are but few species. Of pines there are only the East Siberian larch (*Larix dahurica*)[3] and the stone pine (*Pinus pumila*). None of the other Siberian coniferous trees, such as fir, pine, spruce, Siberian larch, are found north of the Verkhoyansk Range. The spruce disappears to the north of Olekminsk[4] in the Lena Valley.

Of deciduous trees, we find two species of poplar, the aspen, the birch, and several species of willow. Usually, the northern limit of arboreal vegetation is placed at the sixty-ninth degree of latitude, but east of the Kolyma River it lies farther to the south, reaching the sixty-eighth degree of latitude at Chaun Bay, while at Bering Sea it does not extend beyond the sixtieth degree of latitude. As a matter of fact, the northern limit of tree growth cannot be definitely delineated, for, varying with local conditions, it extends into the tundra generally following the river valleys; sometimes the Arctic tundra cuts deeply into the tree zone. In addition, south of the northern forest limits are sporadically scattered tracts of treeless tundra of various sizes, altogether similar in character and vegetation to those in the Arctic zone.

The tree found farthest to the north is the East Siberian larch which like the American fir also reaches the highest altitudes. I observed it

[1] Cherskiy, I. D., Preliminary Account of the investigations of the Kolyma, Indighirka, and Yana River Region (*Supplement to Vol. 73, Memoirs of the Imperial Russian Academy of Sciences*, St. Petersburg, 1893).

[2] Discovery of a Great Range in North-East Siberia (*The Geographical Journal*, vol. 70, pp. 464–470, London, 1927).

[3] To the west of the Yenisei River is found the Siberian larch (*Larix Sibirica*) instead of the Dahurian larch.

[4] East of the Stanovoi Ridge the spruce disappears near the Uda River and the pines and firs extend only as far north as Okhotsk.

2: Jochelson E-5 (1884-1902) 1933 Yakut

●137 on the western as well as on the eastern slopes of the Stanovoi Mountains. Poplar, aspen, and birch (*Betula alba*) are found to the south in the river valleys. The stone pine (*Pinus pumila*) occurs on the mountain slopes. According to my travel diary, on the eastern slope of the Stanovoi Ridge, in the valley of the upper course of the Gishiga River, the poplar and aspen disappear at 515 meters above sea level, the stone pine at an altitude of about 540 meters, while the larch is found at 585 meters, the limit of forest growth.

The distribution of the larch and the stone pine on the eastward and westward slopes of the Stanovoi Ridge differs materially. In Koryak territory the larch disappears at a considerable distance from the edge of the forest zone; in the direction of Bering and Okhotsk seas, I found that the deciduous varieties, the poplar and the aspen, form the limits of arboreal growth in the plains, while the stone pine was highest up on the mountains. On the Taigonos Peninsula I saw the stone pine at an altitude of about 500 meters, absolute height, while the deciduous trees, poplar, aspen, and alder, remained far below in the valleys and gorges. The stone pines of the last mentioned localities are tall trees and not low shrubs like the stone pine of the west.

To the north of the east Siberian larch we find in northeastern Asia only crooked stunted bushes of the dwarf birch (*Betula nana*), Arctic willow, *Andromeda*, *Empetrum nigrum*, and *Ledum palustra* E. which hide their rugged trunks under a covering of mosses and lichens, and send upward only small, weak shoots. This area extends to the Arctic coast.

The cloud berry (*Rubus chamaemorus*), blueberry (*Vaccinium uliginosum*), bilberry (*Vaccinium vitis idaea*), and crow berry (*Empetrum nigrum*) grow among the mosses which cover the swampy places. In some drier, stony or hilly parts, the tundra is covered with various species of lichens, which are eaten by the wild and domesticated reindeer. Often the mossy tundra alternates with areas covered with lichens. In some places the tundra is enlivened by phanerogamous plants—*Rosacae*, *Cyperaccae*, and others. Sedge grasses cover the round mossy hummocks of the swampy tundra.

To the south of the northern limit of arboreal vegetation, mountain passes, and other high land at an elevation greater than three to four hundred meters above sea level, are covered with tundra corresponding in every way to the Arctic tundra.

The territory from the northern limit of arboreal growth, southward as far as the slopes of the Verkhoyansk Range and eastward to the passes over the Stanovoi Mountains, is covered with virgin forests, composed

2: Jochelson E-5 (1884-1902) 1933 Yakut

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chiefly of the East Siberian larch (*Larix dahurica*). In the southern part of the region the poplar, aspen, and birch appear and attain considerable size, trunks three meters and even more in circumference having been encountered. Such trees grow, for instance, in the valley of the Korkodon River where I found full-sized willows. On the upper reaches of the Kolyma River I saw *Prunus padus*, mountain ash, three species of currants, raspberries (*Rubus idaeus* L.), wild rose (*Rubus arctica*). Birch trees are of considerable size. From the southern part of the territory birch wood is carried to the north for the manufacture of dog and reindeer sledges. Rafts of larches are floated down the river for building log huts of the Russian type. The trunks of poplar trees are used for dug-out boats.

On the whole, however, the flora of the polar region is little known, but judging from the data on hand, it may be distinguished by the absence of endogenous plants. This is due to the late retreat of the glacier from the region. On the other hand, the unity of Asia and America in former times resulted in the transfer of some American plants to Asia. Thus Middendorff on the Taimyr Peninsula and Nordenskiöld on the Chukchee Peninsula, discovered a considerable number of species peculiar to the Arctic regions of both the Old and the New worlds.

In 1925 the Russian Academy of Sciences appointed a commission for the investigation of the Yakut Autonomous Socialistic Republic and several expeditions of specialists in various sciences were sent to Yakutsk Province. The first volume of the Memoirs on the vegetation of Yakutsk Province by Professor V. L. Komarov[1] contains two maps, one showing the routes of explorers of the country, including that of the writer, and the other, the northern limits of the distribution of trees. In general, Komarov's graphic presentation coincides with my observations, given above, but I may add some data from Komarov's map. He also shows the Dahurian larch to be the tree which reaches farthest to the north, but on the Lena River it reaches the seventy-second degree of latitude and on the Khatanga River even a little farther northward. The Siberian larch (*Larix Siberica*) which is found to the west of the Yenisei River in place of the Dahurian larch is shown by Komarov in the upper reaches of the Viliui River at the sixty-first degree of latitude. The fir (*Pinus picea* L.) which at the Khatanga River is near the northern limit of arboreal growth, not far from the Dahurian larch, to the north of Latitude 72, extends gradually to the south, reaching Latitude 59 at

[1]Komarov, V. L., Memoirs of the Commission on the Investigation of the Yakut Autonomous Soviet Socialistic Republic, Vol. 1, Introduction to the Study of the Flora of Yakutil (*Academy of Sciences*, Leningrad, 1926, in Russian).

2: Jochelson E-5 (1884-1902) 1933 Yakut

137 Yamsk on the Okhotsk Sea. The northern limit of the aspen (*Populus tremula*) is along the 68th degree of latitude.

Fauna

136 Only a few species of land mammals are represented in northern Siberia. The genera are exclusively of holarctic types, found in both Arctic America and Asia, but in more or less differentiated forms on the two continents. There is unquestionably a close relationship between the forms of boreal mammals inhabiting the two continents—a relationship so intimate that it could only have been brought about through a land bridge formerly connecting the two areas.

About forty species occur in northern Asia. The brown bear (*Ursus arctus*) is particularly numerous in Kamchatka. The polar bear (*Ursus maritimus*) rarely visits the continent, as it lives on the islands, or else on the ice floes of the Arctic. Wolves (*Canis lupus*) keep to the open plains where they hunt reindeer. Red, gray, and dark foxes (*Canis vulpes*) are found everywhere, on the tundra, in the mountains, and in the forests. White and blue Arctic foxes (*Canis lagopus*) are typical tundra animals. Of the smaller carnivorae, the ermine (*Mustela erminio*) and weasel (*Mustela vulgaris*) may be mentioned. The squirrel (*Sciurus vulgaris*) lives on trees and is absent in the tundra. In the forest zone the flying squirrel (*Pteramys*) is also found. Another rodent is the polar hare (*Lepus timidus*) which occurs in great numbers.

To the north of the Verkhoyansk Ridge three species of fur-bearing animals have been completely exterminated by hunters. These are: the sable (*Mustela zibellina*), the wolverene (*Gulo borealis*), and the lynx (*Felis lynx*). The otter (*Lutra vulgaris*) is also rare.

Of the cervidæ, we find the elk (*Cervus alces*), reindeer (*Cervus tarandus*), and, in the mountains, the musk deer (*Moschus moschiferus*). In some of the mountains occurs another ruminant, the mountain sheep (*Ovis nivicola*). In northern Siberia are also found: the Pallas ground squirrel (*Entamios asiaticus*), Siberian marmot (*Arctomys*), and Siberian spermophile (*Citellus*). There are several species of black and red-backed mice and lemmings. The author found, according to the determination of the late Professor J. A. Allen, two new species: the Kolyma red-backed mouse (*Evotomys Jochelsoni*) and the Kolyma pike (*Ochotona Kolymensis*).

Sea fish which ascend the rivers in spring and summer from the Arctic Ocean differ from the fish of the Okhotsk and Bering seas. While the fish migrating from the Arctic Ocean consist chiefly of *Coregonidae*

intensity of the cold, with temperatures which may drop to –65 degrees. /32
Precipitation generally occurs in the first half of winter. The greatest depth of snowfall averages from 30 to 40 cm., and occasionally may be 70 to 80 cm.

Spring is short, begins late (in the middle of April), and may be characterised by sharp variations in temperature. The precipitation during April and May is greater than in the winter months, but is, nevertheless, negligible.

The most characteristic features of the Yakut summer are: continuous sunshine (up to twenty hours daily); very few clouds; a high degree of sultriness in the middle of the day (up to 39 degrees in the shade) and a considerable fall in temperature during the short night; the period without frost lasts from 115 to 120 days; considerable dryness of the air and slight rainfall, about 30 to 40 mm. per month.

Autumn, like the spring, is very short, lasting but two months (September and October); the range in the variation of temperature is very large and the curve of average diurnal temperature falls sharply in October; precipitation is greatly reduced, as compared with that in summer.

The mean annual temperature varies at different points from –6.8 degrees to –10.7 degrees; the mean temperature of January from –35.5. to –44.8 degrees, of July from 18.3 degrees to 19.4 degrees, that of the three summer months being 16.5 degrees.

The mean annual precipitation for a number of years for various localities ranges from 187 to 271 mm. During the five warm months (May to September) the rainfall is from 130 to 192 mm.

Comparative data show that with respect to the quantity and /34
distribution of precipitation, as well as the temperature of the summer /37
months, the Lena-Viliui plain differs but little from the steppe regions /32
of central Siberia (Chita, Irkutsk, Minusinsk and others) situated much further south. This peculiarity of the climate of the central Yakut country should be particularly borne in mind, as an exaggerated importance has generally been attributed to the severe winter frost. Beyond its purely practical importance for the needs of agriculture, this climatic peculiarity affords a clue to the comprehension of many phenomena in the flora and soil of the country which do not otherwise seem in accord with the usual conception of a territory lying between 62 and 64 degrees north latitude. The duration of the period of warm weather and of the [241]
intensity of the summer heat in the region of the Lena-Viliui plain is sufficient to ensure not only the development of a very diversified natural vegetation, but also to render possible the successful growth of cultivated plants having a fairly long period of vegetation.

2: Jochelson E-5 (1884-1902) 1933 Yakut

natural vegetation, but also to render possible the successful growth of cultivated plants having a fairly long period of vegetation.

As a consequence of the continuous extreme winter cold should be noted the universal prevalence through the Lena-Viliui plain of the permanent frozen earth-layer (*merzlota*). The depth to which the soil thaws out varies with the conditions of exposure of the slope, the thickness of the humus stratum of the soil, the character of the humus, the petrographical composition of the soil and the degree of moisture. Likewise of great importance is the composition and character of the vegetation, the meteorological conditions, and the depth of the snow in winter. In 1912 was observed a maximum thaw to a depth of 225 cm. in dry sandy soils under thin pine growth. Dry humus soils thawed out under short grass meadows and meadow-steppes to the depth of 200 cm. Humus and humus-peat soils of moist meadows thawed to a depth of 120–150 cm. In larch forests the permanently frozen layer was encountered at a depth of 75 to 125 cm., the variation being due either to the absence or presence of a moss covering. The soil of swampy peat bogs was always found to be permanently frozen at a depth of 25 to 30 cm. below the surface.

A permanent frozen earth layer has never been found under water. The ice crust formed on the surface of the water is so poor a conductor of heat that it presents an insurmountable barrier to the penetration of low winter temperatures into the depths of the water.

The presence of a permanently frozen substratum must be regarded as a positive agency in conditioning the climate of the Yakut country. In view of the small amount of summer precipitation, toward the close of summer, the entire layer of thawed out soil is very considerably dried up. Such desiccated soil greedily absorbs all the autumn rains. Subsequent frosts rapidly transform all this water supply into crystals of ice, distributed among the particles of the soil. In spring the mantle of snow thaws while the soil remains completely frozen. Owing to the flat surface of the plain the superficial drainage is insignificant, and all the spring water remains *in situ*, and does not percolate through the deeper layers of the soil. During the gradual thawing out of the soil the snow is partly dissipated by evaporation and partly penetrates the soil by following the receding impervious frozen pan. As the upper strata of soil dry, the water collected underneath rises by means of capillary action, and forms a reliable source of moisture for the normal development of vegetation. When this supply is consumed, it is replaced by the last stores of water, which had frozen the preceding autumn in

2: Jochelson E-5 (1884-1902) 1933 Yakut

the deeper strata of the soil, and which become available as the ice thaws. 134 137 132

Thus, the permanent frozen earth-layer presents a most beneficial means for the conservation and very economical consumption of water, without which the whole extent of the Lena-Viliui plain with its 200 mm. of annual precipitation and its 19 degrees of mean July temperature would be converted into an arid desert, incapable of cultivation and entirely devoid of forest.

9: Stadling--85 [2] E-3 (1898) 1901 Yakut
116, 137

"The greater part of the province of Yakutsk is covered by virgin forest, mainly consisting of the Siberian larch and the Siberian spruce. Among the larches the birch is always to be found; in the southern parts the Norwegian spruce and pine, the aspen, and the 'cedar' occur. The shores of the rivers are fringed with different species of willow and the Siberian alder. Natural meadows are found only in river-valleys and on the bottoms of dried-up lakes. On these natural meadows the Yakuts pasture their herds of cattle, and in their neighbourhood they erect their yurtas ."

46: Cottrell--114-115 T-2 (1840) 1842 Yakut
137, 552

"In this part [RCH: in the district around the Kolyman, Anyui and Indigirka Rivers] of East Siberia, vegetation ceases at the 70th degree of north [115] latitude. All is tundra and moss beyond this; but the lakes are larger and more numerous, and the marshes stretch far and wide. There is one of these lakes called by the Yakuts tastakh, which signifies full of stones, remarkable for a quantity of bituminous wood which it throws up. In it are found pieces of petrified rosin, quite clear like amber, and sometimes containing insects incrusted in them. It seems, however, to be lighter than amber, (we have some specimens of it,) and when burned, has not the agreeable smell."

/130 cont./

122 provided almost our only food, in view of the lack of reindeer
123 meat. In laying out the nets, Boldonó used his own boat,
which held our attention because it was made out of poplar
114 wood. That is, in Middendorff (1) /131/ there is a note that
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131]

1. Sibirische Reise /Siberian Journey/,
Vol. IV, Part 1, No. 4, p. 572.

along the streams flowing into the Arctic Ocean west of the Olenék there are poplar boats, the material for which comes from the alluvial islands of the Olenék. Now, however, along the Olenék we had come across neither the aromatic poplar (Populus suaveolens Fisch.), which barely reaches the Tunguska (along it only one specimen was known to the population in the vicinity of Podwolótschnaja /Podvoloshnaya/ as a great rarity and this fell as an offering to science in 1873), nor the aspen (Populus tremula L.), which likewise has its arctic boundary much more to the south. To be sure, we heard that the first-named poplar occurs on some tributaries of the Olenék, indeed, even very far to the north, namely on the little Tyrachtán River, which empties into the Nákukyt River, therefore probably about 70° latitude, but it is said to be very rare everywhere and of so little thickness that it cannot be used for any kind of work. Therefore where did those poplar boats come from? Boldonó's boat came from the Lena, brought from there by his father. If Middendorff's statement does not simply rest on an error, he perhaps means the islands at the mouth of the Olenék, where possibly poplar trunks from the more easterly Siberian rivers, but not from the Olenék, might have been deposited by the sea.

122 On August 17 we saw a young reindeer on the bank and
123 soon afterward a human dwelling. A stop was made, and
while I quickly made my magnetic observations, for which I
now rarely found time, Boldonó went across the river and after
some time appeared in the company of an oldish Jakuten /Yakut/.
We had hoped to acquire in him a talkative successor to our all
too silent guide, but in vain. Even less could be gotten out of

/175 cont./

●137 The timber line now passed by us lies at 71 1/2° latitude. It is not fixed very precisely, for individual streaks of forest extend tonguelike into the tundra, and here and there one finds smaller or larger islands of forest, so that here the transition from forest to tundra, in contrast to what we saw earlier, was a very gradual one. Lone before our last camp it was noticed that the forest was becoming steadily poorer and more stunted, and from there the signs
122 of its imminent cessation multiplied. On the next day we crossed the watershed between the Pur and the Boljkalák, the last large tributary of the Olenék. Since it was no longer snowing we advanced quite rapidly, but when it became dark we had still not reached by far our camping place designated for tonight by the guide, but rather only a very small hut in the middle of the tundra, which we used to revive ourselves somewhat. Then we continued our journey in the darkness and finally reached a small, but cozily warm balagan on the little river Molokó, which empties into the Boljkalák. On the next day we followed the course of this little river and then the Boljkalák itself, but our /176/ guide, in shortening the route by cutting off the bends, multiplied its difficulties and in crossing the steep sides of the bank our narten, and we with them, frequently took a fall. Otherwise Czekanowsky
[133] was very satisfied. The rocks here decidedly no longer belonged
[134] to the Silurian formation which had become so very boring to us, for coal appeared, but unfortunately no petrifactions.

122 In the evening--it was October 20, that is, exactly four
123 months since we had reached the river system of the Olenék at
621 the Ljútscha Ongókton -- we found ourselves at the goal of our long journey, at the little village of Boljkalák lying at the mouth of the Boljkalák into the Olenék, officially Ustj-Olénskoje, i.e., mouth village of the Olenék, and stopped in front of the stately balagan of the local elder, which had been assigned to us for a
[574] dwelling. Informed previously about our imminent arrival, the entire male population -- it was an imposing crowd; we at least had not seen so many people together for a long time, but in all only seven families are said to live here -- stood ready to welcome us and greeted us with low bows as we climbed out, while upon entering the balagan we were received by the ladies of the house.

/185 cont./

233 that had brought us here were led a few versts farther to the right
[182] shore of the Olenék, where there was more food for them. Lack of fodder for the reindeer is the principal reason why the inhabitants here do not keep them as draft animals, but instead use dogs, which, because of the great quantity of fish food that they need, are very troublesome, particularly in years when fish are not abundant. Our host here has a /186/ splendid herd of reindeer, which, however, he keeps with friends in the forest region; aside from the lack of food, the wolves, for which we too had to keep a nightly watch during the trip on the tundra, and in the winter the violent snowstorms, are a danger to the reindeer.

123 During our stay we received many presents of fish and arctic fox skins -- probably not the best, inasmuch as it was seen that we were not experts -- indeed, even garments that were no longer new, which, however, we refused. The people were generously compensated for this with tobacco, tea, sugar, ammunition, axes, and similar articles, in spite of their protests that they did not
431 expect anything at all in return. The custom of giving and re-
571 ceiving presents during visits is widespread everywhere here, and while it is possible that those in higher positions, especially the local administrative officials, do not count on any return gifts, those of the same standing not only desire, but demand them, and it even happens, as Chitrow tells, that such mutual assurances of esteem end in lawsuits because one party is dissatisfied.

122 On the morning of October 23 our narten stood before the door ready for travel -- nothing held us in the north any longer; we left the village at a rapid trot, accompanied for a stretch by the population running alongside. We were going south, following the birds of passage that had hastened on ahead of us long ago -- they had reached their goal long since, but we were still far away, frightfully far! Our stations were the same as before up to the Pur; we traveled as quickly as possible, since nothing held
● [137] us any longer. Czekanowsky only took along a couple of trunks from stunted larches, which were growing in the middle of the tundra in the protection of river valleys; the largest was as thick as an arm and barely ten feet tall, but of a considerable age.

/186 cont./

122 Besides these stunted /187/ trunks, however, roots of great forest
(137) trees were found here and there in the ground far beyond the present timber line. A few such roots were pointed out to us; they show that the timber line is receding.

On the Pur this time we were assigned a very fine balagan in Kuladý for a dwelling, in which we rested for a day from the exhausting trip across the tundra. On this occasion I must say
621 something about the inhabited places here. Boljkalák, like a
361 number of settlements on the Lena which we succeeded in seeing later, can properly be designated as a village. If it does not wholly correspond to our conceptions of such, nevertheless at least a few huts stand together, more than one family lives there, and the inhabitants themselves appear to be more prosperous. On the other hand, all the other places that we encountered on our journey are to be compared with, say, the Latvian workers in Livonia (scattered farmsteads) -- the Russian designation here for this is urótschischtsche. On quite a large area, which is customarily named after a little river, a few balagans lie scattered in the forest, often versts apart, and here, too, in Kuladý. Even the balagan about five versts away in which we had previously stayed not far from the Pur was, it seems, counted as belonging to Kuladý. /The last paragraph of p. 187, p. 188, and the first paragraph of p. 189 are omitted in the translation; see the foreign text. Page 189 continues as follows./

122 On the evening of November 1, we finally arrived safe and
123 sound in the village of Ssiktjách /Siktyakh/ on the Lena, where we found the friendliest reception in the house of Rjeschétnikow. Having been informed of our imminent arrival by the Cossack long before, Mrs. Rjeschétnikow had put in order for us her only two rooms. The building consisted essentially of a Jakut /Yakut/ yurt, but was much larger than those offered to us before, on which two small rooms had been built; in one of the latter there was a Russian stove, which opened up the agreeable prospect of
241 freshly baked bread. We were entertained not only with that, and
122 with fine cakes, fish, and the like; Mrs. Rjeschétnikow daily
123 showed us hospitality with splendid potatoes which she had grown

/201 cont./

122 water, the latter of which, even though not deep enough to en-
133 danger the traveler himself, can, because of the intense cold, be a hindrance to the reindeer and, in addition, covers the runners with a crust as hard as stone, which makes progress very difficult. As it is, in intense cold, the runners must be freed of the clinging ice every day before setting out. The Ebetén comes out of the Chara-ulách Range, which, forming a branch of the Werchojánsk /Verkhoyansk/ Range, runs a long way along the right bank of the Lena. From Ssiktjách on we had admired its
• [137] picturesque forms along the other shore of the river. Moving up the valley of the Ebetén, we soon found ourselves on the tundra again; only in very sheltered places did we now and again see a few larch trunks. Probably only the high altitude has robbed this region of forest growth, but this mountain tundra, just like that along the shore of the Olenék, changes directly into the sea tundra.

122 We spent the night in a balagan that was still in the Ebetén valley and on the evening of the next day, after climbing over a low pass in the Chara-ulách Range, cutting across the Chara-ulách River, and then moving down the valley of the Gölynkaí River, again reached the vicinity of the Arctic Ocean, which forms a deep bay here. About eight or nine versts from the sea-coast lies the balagan Tass-Tumüss, where the roads to Ustjjansk /Ust-Yansk/ and to Werchojansk /Verkhoyansk/ intersect. We could not have wished for more comfortable quarters. We admired the enormous beams of our dwelling, which were several feet wide -- they had evidently /202/ been carried down to the sea from the distant south by the force of the currents and then, perhaps after being tossed about for a long time, had been deposited on this inhospitable shore; indeed, who can say whether they even grew on Asiatic soil or reached here from American shores by means of some still unknown ocean current. Animated by the merrily dancing fire of the fireplace, we found pleasure in the thought that now at last we would actually be turning away from here to the south, to where -- perhaps only after many weeks -- we would see trees like those that now sheltered us from the cold breath of the Arctic Ocean. Many a traveler before us had probably indulged in similar thoughts here; the inscriptions on the

/208 cont./

133 taking in the whole southern and part of the eastern horizon,
122 over which our route was to take us, opened up before us -- the Kullár Range, which, running in a northeasterly direction, seemingly parallel to the Chara-ulách Range, forms the watershed here between the Omoloí and the Jana /Yana/ basin. Although both the Kullár and the Chara-ulách ranges are probably only spurs of the main watershed between the Lena and the Jana, whose collective name, however, we could not discover, their appearance here is very different. Instead of the frequently picturesque, jagged, often conically-shaped peaks of the Chara-ulách, here we saw only massive rounded heights with steep
• [137] slopes and broad flat valleys in between. After we had traveled about five versts from the Omoloí across a completely unwooded plain, we reached the /209/ foothills rising steeply, but not high, and covered with woods, and finally, after another six to eight versts, the completely treeless heights of the mountains; in the valley of an insignificant tributary of the Omoloí, the Kylagóttu, we reached the altitude of the pass, which rises at least 1,300 feet above the Omoloí and is topped by the surrounding peaks by
[136] another 400-500 feet. Here, by the way, we saw only a lower
[192] part of the range, which is said to reach much greater heights in the source area of the Omoloí, which is to be seen merely from the fact that wild sheep (tschubukún) are said to be found there in abundance, while they are still absent here.

122 Directly after the watershed we reached an insignificant
13 brook, Kargýchala, already belonging to the Jana basin, down whose broad valley, running southwest, we soon reached the little river Tass-Apká and the stan of the same name, which was to serve as our lodging for the night. The southern slope of the Kullár Range is considerably less steep than the northern slope; on the other hand, the tree vegetation on the latter is more vigorous and goes up farther, probably likewise evidence that the climate becomes milder toward the shores of the Arctic Ocean, which was also shown by a comparison of the temperature observations in Ustjjansk /Ust-Yansk/ and Werchojansk /Verkhoyansk/, as well as the completely unanimous statements of the natives.

/209 cont./

as well as the completely unanimous statements of the natives.

122 Our further journey, always in a southwesterly direction, went down the valley of the Tass-Apká to where it empties into the Bytantaí River, where the region was already beginning to [132] become more populous. Everywhere we noted traces of human activity, fences and great haystacks; horses and cows roamed about in the open in spite of the snow falling heavily and the • [137] prevailing temperature of about -25° R. The woods also began to look more imposing and we were especially pleased to see along the river banks /210/ now and then quite stately, straight, and thickly-branched trees, not seen for a long time. Unfortunately we were quite unexpectedly delayed here. In the stan Tass-Tumssá, which we reached soon after midday, the station manager, or rather his substitute, absolutely refused to grant us the necessary reindeer for our further journey, and he could not be induced to yield either by our official documents and threats that we would have him punished by the isprawnik /ispravnik/ or by the remonstrances of a Jakuten /Yakut/ elder who happened to be present. The latter, since he did not reside here, could only put his own two reindeer at our disposal, and thus it would have been difficult for us to do anything but turn for help to the authorities at Werchojansk /Verkhoyansk/, by which we would have lost several days at least, had not our guide up to here, Iwan Borogón, been kind enough to undertake our further advance to Werchojansk with his own reindeer.

122 On the next day we crossed a mountainous region and climbed 133 three ridges, Kuwaláss, Idomopút, and Kyrá, the middle one of which was quite insignificant, while the two others also seemed to rise only about 700 feet above the last night's lodging, and spent the night in the stan Tykák on the river of the same name, in the valley of which we covered the greatest part of the next day's journey and in doing so, in order to cut off the many bends, traveled sometimes on the one bank, sometimes on the other. [132] After climbing a ridge, Koptolák, rising about 1,000 feet over the immediate surroundings, we stopped at the stan of the same name, where toward the morning of November 17 I again noted

51: Müller--131 N-2 (1873-1875) 1882 RV2 Yakut RV2

/231 cont./

135 are practically unexploited, at most in a primitive fashion and only occasionally by one or /232/ another of the Jakuten /Yakut/. A Russian mining engineer is said to have explored the region years ago and reported that mining would not pay, because the ore deposits lie in a waterless and woodless region. That would hardly be an obstacle in America.

122 369 At the cozy fire of the Jakut fireplace we enjoyed the hospitality of Mr. Bereshnów and his traveling companions, who hastened to serve us all kinds of things that we had not seen for many a long day -- they had come from the capital, Jakutsk /Yakutsk/, which among the inhabitants of the Jakuten country plays just such a role as St. Petersburg or Moscow does for European Russians. It is simply the ideal of the greatest possible comfort, fashion, and culture. We were able to express our gratitude only by presenting some articles from our traveling household that we could now dispense with, particularly some enameled iron plates, which were still unknown to the gentlemen and aroused their great admiration as being most practical. /The last paragraph of p. 232 and pp. 233-236 are omitted in the translation; see the foreign text./

/237/ Eleventh Chapter

220 Northern virgin forest. -- Water flowing with the mercury frozen. -- G. F. Ssolowjów. -- Smallpox epidemic. -- Jakut /Yakut/ post station. -- Arrival in Jakutsk /Yakutsk/. -- The governor. -- Bishop Dionýssij. -- The trade of Jakutsk. -- Furs. -- The climate and agriculture. -- History of same and statistical data. -- The classic Progymnasium and other points of interest. -- Industry of the Jakuten /Yakut/. -- Return journey.

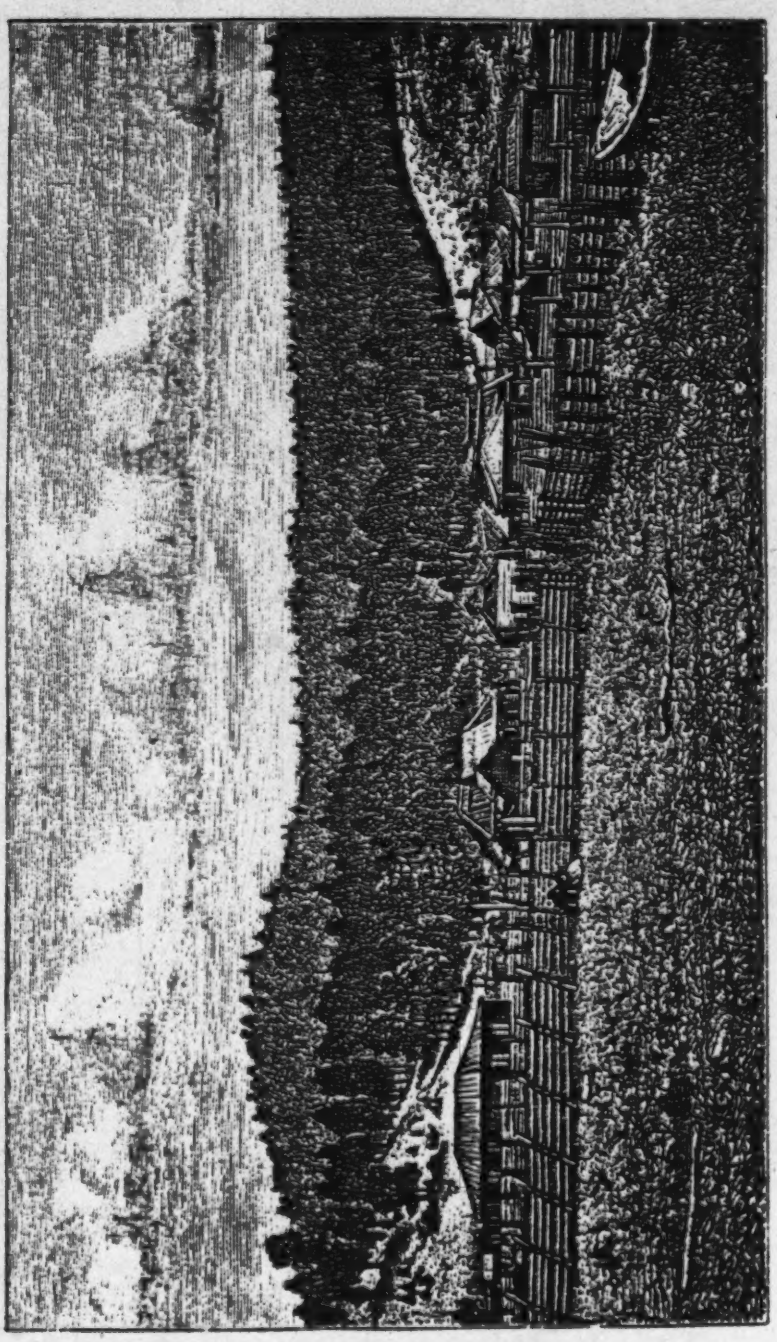
122 ● 137 We left our comfortable night's lodging as early as possible on the morning of December 3. The route led us down the valley of the Tukulána through a magnificent forest, more beautiful than any we had ever seen. The eye of the traveler coming from the north is delighted here for the first time by enormously high and

/237 cont./

137 thick trees, standing magnificently tall and close together, with rich and varied undergrowth. Almost all types of Siberian timber appear here together and in such beautiful specimens that one can scarcely believe that they are standing at their arctic boundary -- first the white birch in whole stands of the most beautiful trees, then the mountain ash (Sorbus aucuparia) with its beautiful red berries, which the snow had not yet knocked off, also the black alder (Prunus padus), and the fir (Pinus abies), the latter at first in individual specimens, then in quite magnificent groups, and then, of course, all the other /238/ types of timber found farther to the north -- larch, willow, poplar, aspen, dwarf cedar, as vigorous here as in the distant south. We missed only one forest tree -- the Scotch pine (Pinus sylvestris), but we greeted even it on the following day.

122 133 Wherever the dense forest occasionally permitted us a view, we saw on either side of the valley high, wild, jagged mountains of exactly the same character as those of the watershed crossed by us. On the previous evening it had seemed to me more than once as though a murmur like that of flowing water was to be heard under the stones over which we climbed, but in the uncertain moonlight none was to be found; today in the daylight, however, we saw it quite plainly and were glad to have escaped the danger of falling into the water in the dark and then undoubtedly freezing our feet. Middendorff in his work speaks a good deal about this peculiar phenomenon which is closely related to the Aufeisbildungen / surface ice formations/; nevertheless a truly satisfactory explanation cannot yet be given. Water flowing for quite long distances at close to -40° R. is certainly difficult to explain, even though one thinks of hot springs, which do come into it. Only very detailed local observations in all seasons of the year, which, of course, the naturalist passing through cannot undertake, make it possible to solve such puzzles.

51: Müller--152 N-2 (1873-1875) 1882 RV2 Yakut RV2



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Shérbinsk / Zherbinsk/ Station on the Lena.